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path of progress." We can heartily commend this book to all workers among the poor.

PERCY ALDEN.

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COSMIC ETHICS, OR THE MATHEMATICAL THEORY OF EVOLUTION: showing the full import of the Doctrine of the Mean, and containing the Principia of the Science of Proportion. By W. Cave Thomas, F.S.S. London: Smith, Elder & Co., 1895. Pp. xix., 296.

The doctrine which this book attempts to set forth and maintain is suggested in a sentence from Dryden, quoted on the title-page: "There is a mean in all things, and a certain measure wherein the good and the beautiful consist." The work is "designed to form an exhaustive argument in support of that grand generalization [that] the FORM of phenomena, of experience, is *quantitative*, in support of that grand generalization which resolves all relation fundamentally into *quantitative* relation, *into definite proportional relation*, and all design in Nature and in Art into adaptation of proportion to purpose." In elucidation of the meaning of this statement, we are told in a note that "the word *form* is here used in its philosophical sense;" but this seems to conduce as little to getting rid of ambiguity as if we were to explain that, *e.g.*, Nature is used in its theological sense, or Justice in its political sense. We are informed that the Mean has been recognized "from time immemorial as the common measure of rightness in Nature," and this is adduced as "one of the strongest evidences of the truth of that important generalization" above referred to, with confirmatory references to Pythagoras, the early Freemasons, and Confucius.

"All exact knowledge," it is said, "thus becomes that of *definite proportional relation*," and Evolution "may be defined as the becoming of the proportioned, and the at-mean-ment of Nature the goal of progress."

We further learn that the "doctrine of the mean" applies in all departments of knowledge,—not only in Mathematics and Astronomy, but also in Æsthetics, Hygiene, Education, Politics, Natural Theology, etc.

It is, of course, obvious that in various departments examples of excess and defect are continually occurring; but the tendency of things is said to be ever to redress the balance, to compensate an error made in one direction by a corresponding error in the opposite direction, by a series of equilibrations or compensations; and it is from this point of view that the title of "Cosmic Ethics" has been chosen.

The application of the doctrine of the Mean in the various departments above enumerated is considered in the several chapters of the book; that one (Chapter IV.) which considers *Proportion as the Basis of a science of Æsthetics* being much the longest and most elaborate, while Chapter II.—*The Principia of Just Proportion and of the Mathematical Theory of Evolution*—is in form suggestive of Newton's "Principia," or Whewell's "Novum Organon Renovatum," and consists of a series of forty-three axiomatic statements —*e.g.*, "2. The form of phenomena, of experience, is quantitative, therefore all knowledge is fundamentally mathematical; all knowledge is the knowledge of correct measure and of definite proportional relations."

"16. Everything is either as it ought or as it ought not to be,— that is to say, is either proportioned or disproportioned. Right and wrong, perfection and imperfection, therefore, inhere in right and wrong measures and proportions."

"20. As every species of phenomenon fluctuates within definite limits, the sum of the measures of all its possible variations divided by the numbers of those variations would yield that mean or average which experience demonstrates is its right or perfect measure, etc."

Without going into the particulars of the detailed consideration, it may suffice for our present purpose to discuss, generally, the import and value of the doctrine of the Mean which is thus offered as a kind of universal clue and test.

Admitting that quantity is a necessary category of the object of thought, that for mathematics it is primary and fundamental, and that for many purposes relations of quantity or proportion are important and interesting, it by no means follows that the quantitative mean is "the goal of all right formative activity," "the central and recurring measure of rightness and proportion . . . throughout existence," the fundamental relation into which all other relations can be resolved. So far from this being the case, relations of quantity cannot be even apprehended, still less stated, apart from relations of qualitative diversity.

This seems clear if we analyze the import of judgment, or refer to the obvious consideration that any quantity must be a more or less of somewhat that is distinguished from other things primarily by its quality as distinguished from its quantity.

When the author says that "*The quantification of the predicate*, about which, some years since, there was so much discussion, was an inevitably necessary consequence of the fundamentally quantitative nature of our experience," he seems to imply (1) that this doctrine has met with general acceptance, (2) that its acceptance involves a purely quantitative interpretation of the import of propositions.

But neither of these implications can be allowed. The utmost that would generally be conceded to quantification of the predicate is that it is a necessary stage in conversion; even in quantified propositions, the relation of diversity of quality as between subject and predicate is indispensable to significance of assertion; and what was at the bottom of Hamilton's advocacy of the doctrine was probably a sense of the very important logical difference between relations of Terms (subject and predicate) and relations of Classes.

The way in which *obiter dicta* of stray writers apparently in favor of the author's view are quoted, as though conclusive on the question, suggest an inadequate conception of the kind and degree of proof necessary for establishing principles of such importance. *E.g.*, we have the following: "More recently . . . the fundamentally quantitative *form* of our knowledge has dawned upon the mathematicians, as may be gathered from an article in the 'Athenæum' of April 4, 1874: 'Dr. Boole converted logic into a mathematical calculus, and Professor Jevons has shown how it may be made a purely mechanical process. . . . Surely the mathematicians are avenged upon their adversary.' And again, 'It is well that we should be enabled to see what is the issue of reducing alike knowledge and existence to quantity.' "—What does this prove except that a writer in the *Athenæum* can occasionally talk nonsense?

"If knowledge and existence are quantifiable," the author further remarks, "all resemblances and differences are resolvable into *quantitative* resemblances and differences."

But surely the antecedent here by no means justifies an inference to the consequent.

Further difficulties appear when we ask, How far are we to regard the Mean as actually realized, and how far as tending to be more perfectly realized in the future?

On the one hand, we are told that, for instance, in the solar system "any temporary aberrations in the movements of the planets are redressed by that law of compensation, of complementary adjustment, which obtains and which preserves the mean immutable through all the vicissitudes of the solar system."

"That excess in one direction should inevitably be either accompanied or succeeded by a defect in another, in any species of phenomenon, is a necessary consequence of that inexorable law of the libration of compensation which pervades nature." "Nature always averages right."

On the other hand, we learn that "All progress, in the sense of improvement or betterment, is towards the proportioned [the mean], and the exposition of this becoming nothing more nor less than the exposition of the mathematical theory of evolution."

"Nature is modifiable. . . . It is therefore man's paramount duty to take advantage of this plasticity or modifiability and to rectify, to restore, all within his power, etc. . . . The rectification of nature in measure and proportion definitely expresses man's formative mission, his divine mission."

"The observance of the golden mean will gradually come to be recognized. . . . A tendency towards moderate counsels may be observed to be growing amongst nations." "The mean is the mathematical expression for that perfect measure in which nature is to be reconstituted by the undoing of excess and the making good of defect. This universal *at-mean-ment* is the goal of evolution, and adumbrates the rectification of all things."

But if the Mean actually *is* preserved immutable in Nature by the operation of her own laws, what need is there for *betterment*, what room is there for *evolution?*

The most serious difficulty, however, occurs when we are called upon to regard the Mean (the principle of moderation) as the common and immutable measure of *rightness* in nature (and elsewhere). The doctrine of the Mean (the proportioned, the medium between excess and defect) is, "as the central principle of *rightness*, supreme in the kosmos." The Mean is the measure of the *right* in physics and in mental and moral phenomena also.

But what meaning can we attach to the phrase, "rightness in physics" or "in nature"? Is there a right and wrong in chemical affinities and repulsions, or in the attraction of gravitation? What is "*rightness* and proportion in the spheres"? The Mean, it is affirmed, is "the mathematical expression for rightness, for perfect well-being throughout the kosmos." But can "rightness" or "perfect well-being" receive adequate mathematical expression?

We may, of course, have *more* or *less* of right or well-being; we may have a certain proportion of elements which we approve as right or perfect; but there seems no reason to hold that the mere mean between the extremes of actual experience is necessarily a desirable quantity, and if one quantity is preferable to another in any case, it can only be so with reference to the circumstances of the case and the kind of qualities concerned. Of some things we can never have too much, of others the smallest instalment may be more than enough.

When it is affirmed that the proportioned is the ideal,—the right, the true, the beautiful,—if what is meant is the *rightly* or *duly* proportioned, the assertion is indisputable; but it is also circular and begs the question. If we make Right, etc., depend upon any other and *mere quantitative* test, the view is plainly inadequate.

I conclude, then, with regard to the general doctrine of the book, *first*, that it is not only unproved, but also unprovable, that all relations can be resolved into relations of quantity; *second*, that the author has pressed the doctrine of the Mean beyond what it will bear, and has not kept clear the distinction between what *is* and *what is coming to be*, or between the *actual* and the *ideal*. The exaggeration here given to quantitative considerations is a striking instance of the "human too much," which, by such a strenuous advocate of the doctrine of the Mean, ought to have been avoided.

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CHRISTIAN ETHICS. Eight Lectures preached before the University of Oxford, in the year 1895, on the foundation of the late Rev. John Bampton. By Thomas B. Strong, M.A., Student of Christ Church. London, New York, and Bombay: Longmans, Green & Co., 1896.

This is a good and interesting book. Mr. Strong regards his subject from the point of view of one who adopts the traditional Christian position. For him, the main point is that Christianity gave to man a new spring of moral life, because it admitted him, "in proportion to the certainty of his faith in it, into a clear and decisive knowledge of the spiritual Divine order."

Mr. Strong is in sympathy with the ruling ideas of modern philosophical ethics. He holds the unity and solidarity of mankind. He sees that the individual can have no moral life apart